DOCUMENT RESUME

ED 135 671 SO 009 434

AUTHOR	Neumann, Manfred J. M.
TITLE	A Study in West German Stabilization Policy, 1956-1974. German Studies Notes. First Draft.
INSTITUTION	Indiana Univ., Bloomington. Inst. of German Studies.
SPONS AGENCY	Volkswagen Foundation, Hanover (West Germany).
PUB DATE	76
NOTE	53p.; Paper presented at a Symposium on German Economic Growth and Stability (Indiana University, Bloomington, February 16-17, 1976)
AVAILABLE FROM	Institute of German Studies, Ballantine Hall 655, Indiana University, Bloomington, Indiana 47401 ($1.00)
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	Credit (Finance); Economic Change; *Economic Climate; Economic Development; Economic Factors; *Economic Research; *Economics; Finance Reform; *Foreign Countries; Futures (of Society); Government Role; Graphs; Money Management; *Money Systems; *Public Policy; Statistical Analysis; Tables (Data)
IDENTIFIERS	*West Germany

ABSTRACT

The dominant driving force of past movements in West German output and prices is investigated and a review of government policy undertaken to stabilize these movements is presented. Three alternative impulse hypotheses are tested: the monetary, the fiscal, and the foreign impulse hypothesis. The major results of the tests are that: (1) monetary impulses dominate fiscal impulses in shaping cyclical fluctuations of domestic output as well as of the price level; (2) while the evidence corroborates the hypothesis that fiscal impulses contribute to the emergence of inflation, it does not support the contention that fiscal impulses have any significant net effects on the growth of output in the shorter run; and (3) real foreign impulses play a significant role with respect to both movements of the domestic price level as well as changes in output. The author concludes that the traditional tying of government spending and tax policies to the shorter run considerations of stabilization policy lacks justification. Chapters provide some basic information on the performance of the economy during the past two decades, describe the testing of the three impulse hypotheses, and discuss the controllability of the money supply. The last chapter presents a summary and conclusions. Charts, statistical tables, graphs and footnotes are presented. The document concludes with comments on the paper by James M. Boughton of Indiana University. (Author/DB)

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German Studies Notes

PUBLISHED BY THE INSTITUTE OF GERMAN STUDIES/INDIANA UNIVERSITY

Indiana University Ballantine Hall 666 Bloomington, Indiana 47401

ED135671

SP009434

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A STUDY IN WEST GERMAN STABILIZATION POLICY, 1956-1974

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First Draft

Bloomington, Indiana: Institute of German Studies, 1976

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This paper was delivered at a Symposium on German Economic Growth and Stability which was held at Indiana University on February 16-17, 1976. Planned by Professor Franz Gehrels, Department of Economics, it was also co-sponsored by West European Studies. The meeting was part of a Comparative Systems Analysis focusing on the Federal Republic of Germany and the United States. This project is being conducted at the Institute of German Studies with support from Stiftung Volkswagenwerk. The Institute gratefully acknowledges this support.

Critical comment on Manfred J. M. Neumann's paper is offered by James M. Boughton, Indiana University.

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Inquiries should be addressed to the Institute of German Studies.

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I. INTRODUCTION

West Germany is known for its strong currency based on a relatively favorable economic performance: an average real rate of growth of 5 percent p.a., an unemployment ratio of 1 percent and an average rate of inflation of about 2.5 percent p.a. However, this is the picture of the sixties which, unfortunately, does not fit anymore.

During the past two years West Germany has experienced its deepest recession since the foundation of the Federal Republic. The real rate of growth fell from 5.1 percent p.a. in 1973 to .4 in 1974 and -3.6 in 1975. The average ratio of unemployment doubled every year, increasing from 1.3 percent in 1973 to almost 5 percent in 1975. Only the rate of inflation, as measured by the rate of change of the cost-of-living index, turned a bit more favorable. During the early seventies it had risen continously, reaching an average level of 7 percent p.a. in 1974. During the course of 1975 it came down to a new low of 5.4 percent p.a. (average: 6 percent) in November.

It is tempting to proceed to sketching the scenario which we expect to develop in 1976 and 1977, however, this would take us beyond the purely academic scope of this paper which is devoted to studying the past instead of speculating about the future. The major question we will investigate is which was the dominant driving force of past movements in West German output and prices. We will put to test three alternative impulse hypotheses: the monetary, the fiscal and the foreign impulse hypothesis (chapter IV). The two preceding chapters are intended to give some basic information (i) on the performance of the economy during the past two decades, and (ii) on the conceptional background of past stabilization policy. As the tests will reveal that monetary impulses dominated the aggregative effects of fiscal impulses there will also be some discussion of the issue whether the West German monetary authorities were able to control the total monetary impulse or whether the fixed exchange rate regime allowed offsetting capital flows to dominate monetary events (chapter V). Finally, we will draw some conclusions with regard to the future formulation of stabilization policy in the West German context.

II. ECONOMIC DEVELOPMENTS SINCE THE MIDFIFTIES

Table 1 gives some basic information on the development of the West German economy during the last two decades.

As the data reveal the over-all performance has not been too bad. On the average the real rate of growth has been 5% p.a., the unemployment ratio less than 2% and the rate of inflation, measured by a representative cost-of-living index, 3% p.a. If one leaves the fifties out of consideration [1] one even finds that the unemployment ratio has been closer to 1 than to 2%.

However, judged on the basis of individual cycles, and more so on the basis of individual years, the performance has been much less satisfactory. These has been a considerable amount of variation in the rates of growth of real GNP (0 to 12% p.a.) and of the consumer

Table 1: Basic Economic Indicators

Annual Averages

Cycles	$\hat{y}$ % p.a.	U %	P^c % p.a.	ΔNIR Bill of DM	p^S DM	x $\hat{y}$ %
1955-58	6.9	4.0	2.3	3.86	4.20	20
1959-63	5.7	1.2	2.3	1.47	4.07	20
1964-67	3.6	1.1	2.7	.24	3.99	22
1968-71	5.9	1.0	3.0	8.75	3.76	27
1972-74	2.9	1.7	6.3	13.40	2.81	34
1955-74	5.1	1.8	3.1	4.95		24
Min.	- .2 (1967)	.7 (1970)	1.0 (1959)	- 10.26 (1969)	2.59 (1974)	18 (1955)
Max.	12.0 (1955)	5.1 (1955)	7.0 (1974)	26.43 (1973)	4.21 (1955)	38 (1974)

Hats indicate growth rates. y = Real GNP, U = unemployment ratio, P^c = consumer price index, ΔNIR = change in net international reserves held by the Deutsche Bundesbank (valued at current exchange rates), p^S = spot rate of the US-dollar in Frankfurt, x = real exports. Sources: Federal Statistical Office, Federal Labour Office, Deutsche Bundesbank, Deutsche Institut fur Wirtschaftsforschung.

price level (1 to 7% p.a.), indicating that the German authorities have not been able to hold the economy on an even track. More seriously, the data reveal that the trend rate of real growth is declining while the rates of inflation apparently follow a positive upward trend.

On the balance-of-payments side we find the typical picture of an open economy running on the basis of a permanently undervalued currency. Heavy balance-of-payments surpluses have been the order rather than an exception. The cumulated net inflow of foreign currency, measured over the last two decades, amounted to 99 billion DM. The main source has been the foreign trade account. Export surpluses ranged from 1.2 billion DM in 1955 to the record of 50.8 billion DM in 1974. Measured in real terms the GNP-share of exports increased continuously, from about one fifth in the late fifties to one third in the early seventies, and this development apparently was not seriously hindered by the pronounced revaluation of the Deutsche Mark since 1970.

Clearly, the extensive world-market orientation of the German industry is an asset to the economy because it enforces a continuous search for a more efficient allocation of resources. On the other hand, one cannot overlook serious drawbacks a too pronounced export orientation may have with regard to stabilization policy. Depending on the situation the authorities in charge of stabilization policy may be confronted with an uphill fight which easily induces them to overreact as policy impacts will be more delayed than usual giving the misleading impression that instruments have become weaker than they used to be.

The fiscal scene of West Germany exhibits some remarkable features; see table 2. It is most noteworthy that total government (including federal, state, and local governments) did not increase its relative absorption of real GNP. Instead its share remained a constant 14 percent. This is also reflected by the almost constant average tax rate of 23 percent. Government borrowing has until only recently always been negligible, amounting to 1 to 2 percent of nominal GNP. The only exception was 1967 when Keynesian ideas to the first time significantly entered the thinking of government officials thanks to the brilliant Karl Schiller who by the end of 1966, in the middle of West Germany's first recession, became minister of economics. On the basis of Keynesian reasoning he did not hesitate to promise the public a "tailored recovery" and pushed government borrowing up by 15 billion DM, equivalent to 3 percent of GNP. This remained a record until only recently, and indeed a strong recovery emerged. Today, however, we know that contrary to Schiller's imaginative rhetoric of those days it was not fiscal policy that moved the economy out of the recession

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Table 2: Fiscal Indicators

Annual Averages

Cycles	$\hat{g}$	g/y	T/yp	ΔS/yp	g^P/g	$\hat{p}^G$	$\hat{p}^{GE}$	$\hat{p}^{GO}$
	% p.a.	%	%	%	%	% p.a.	% p.a.	% p.a.
1955-58	4.4	.14	.23	.009	.59	4.0	5.3	2.2
1959-63	7.6	.14	.23	.013	.50	3.9	5.8	2.0
1964-67	2.3	.14	.23	.022	.49	5.4	6.4	4.4
1968-71	4.1	.13	.23	.012	.49	7.8	9.2	6.5
1972-74	4.2	.14	.24	.017	.48	9.4	9.4	9.4
1955-74	4.7	.14	.23	.014	.51	5.8	7.0	4.6

Hats indicate growth rates. g = Real government expenditure, T = total tax revenue, ΔS = change in total government debt, g^P = real government expenditure for civil service, p^G = deflator of government expenditure, p^{GE} = deflator of civil service expenditure, p^{GO} = deflator of remaining government expenditure. Sources: Deutsche Bundesbank, Deutsche Institut fur Wirtschaftsforschung.

but the consecutive effects of a favorable demand for Germany's exports and an expansive monetary policy.

Finally, consider the rates of change of the deflator of government expenditure for goods and services. The average rate over the last two decades was 5.8 percent p.a. and, thus, almost twice as high as the average rate of increase of the cost-of-living index. The difference to a large extent is due to the inclusion of wages and salaries for government employees. However, if they are excluded, the remaining index still exhibits higher rates of inflation than the cost-of-living index and the difference between these rates has increased ever since the mid-sixties.

Finally, let us consider important monetary indicators; table 3. We note first that the long-run movements of the narrowly defined money stock, M, and of nominal GNP have been fairly close since changes in income velocity have been negligable. Next we find that the long-run movement of M, has been dominated by the growth path of the extended monetary base. The contribution of the money multiplier has not been much different from zero, since the expansionary influence of the downward trend of the public's currency ratio in the long run is approximately matched by the counter-influence of the upward trend in the public's time and savings deposit ratio.

Table 3: Monetary Indicators

Annual Averages

Cycles	$\hat{M}_1$ % p.a.	$\hat{m}$ % p.a.	$\hat{B}^e$ % p.a.	Contribution of NIR % p.a.	Contribution of DC % p.a.	i %	$\hat{V}$ % p.a.
1955-58	10.1	-.2	10.3	20.0	-9.7		-.3
1959-63	9.3	.4	8.9	4.2	4.7	6.0	-.6
1964-67	6.5	-.3	6.8	.5	6.3	6.7	-.1
1968-71	8.1	.8	7.3	13.1	-5.8	7.4	2.7
1972-74	8.9	-.7	9.6	17.3	-7.7	9.2	.0
1955-74	8.6	-.3	8.9	9.9	-1.0		.3

Hats indicate growth rates. M_1 = exclusive money stock; m = money multiplier (ratio of M_1 to B^e); B^e = monetary base extended for reserves liberated or impounded by changes in official required reserve ratios; NIR = net international reserves held by the Deutsche Bundesbank (valued at current exchange rates). DC = domestic component of base money creation; i = yield on newly issued bonds; V = income velocity of M_1. With the exception of i all figures are computed from year-end data.

A decomposition of the growth rates of the extended monetary base into the contribution of its main proximate determinants reveals a typical feature of the money supply process in an open economy with a relatively strong currency, given fixed exchange rates: International reserve inflows form the most important long-run determinant of the domestic money supply. However, note the tremendous cycle-to-cycle variation in the contribution of international reserve inflows which may have posed a serious threat to a monetary management aiming at stabilization. We will come back to this question in a later part of this paper.

III. THE CONCEPTIONAL BACKGROUND OF STABILIZATION POLICY

Stabilization policy has become a heated issue in West Germany since the experience of the recession of 1966/67 when to the first time since the foundation of the Federal Republic the real rate of growth turned negative. During the decade before in the opinion of the public and of many policy makers stabilization policy played a secondary role. There was a widely held believe that the threat of pronounced swings in economic activity, as experienced before World War II, had gone forever.

This relaxed attitude vis-a-vis cyclical movements of the economy is not as surprising

as it may appear in the first instant, if one takes into consideration the overall performance of the economy at that time. All over the fifties (the so-called reconstruction period) the German economy was running on a real rate of growth well above 5 percent p.a., and it continued on this path during the early sixties. Between 1950 and 1966 there were three years only during which real growth fell below that rate (1958:3.7; 1962:3.6; 1963: 3.4). Employment was almost continuously rising, from 13.8 Million in 1950 to 20.2 Million in 1960. The unemployment ratio reached an unknown low of .7 percent in 1961 and remained at this favorable level until 1966. Clearly, on the negative side there was a continuous inflation of about 2 percent p.a. However, in general, this was not considered to be a serious problem, as the rate of inflation was relatively steady. According to a wide spread contention at that time such a low rate of inflation was unavoidable and, therefore, not in conflict with the goal of price stability. [2] The satisfactory performance of the economy alone would not necessarily have been a sufficient reason for viewing stabilization policy as a matter of secondary importance but it seemed to corroborate the fundamental principle of the governments' economic reasoning according to which the government had to set and to safeguard the economic order and the rules of the game but must not intervene directly into current economic processes. The roots of this reasoning laid in the writings of the German neo-liberal school which was headed by economists like Walter Eucken and Müller-Armack.[3] It was Professor Ludwig Erhard who, convinced of the soundness of neo-liberal thinking, carried these ideas out. From hindsight, his most important action was his courageous decision in 1948 to free all prices, at a time when central planning of economic processes still was a very appealing idea to most German politicians, christian and social democrats alike. The remarkable success of Professor Erhard's reinstitution of a liberal market economy banned all concepts of a policy of systematic demand management from playing any role in government's policy until 1966 when Professor Erhard had to resign as Chancellor of the Federal Republic.

In 1966/67 the scene changed considerably. Professor Schiller became minister of economics. He and his followers popularized the Keynesian idea of demand management and integrated it into a redesigned concept of economic policy. Under the leitmotiv "As much market economy as possible, as much planning as necessary" a law for "the promotion of economic stability and growth" was introduced which essentially pushed fiscal policy into the forefront of the fight for stabilization. The Keynesian design of the stabilization law was evident: (1) The law called for an anti-cyclical conduct of fiscal policy and a synchronization of the states' budget policies with the Federal budget policy, in the short run as well

as on a longer-term planning basis. (2) The law gave the Federal government the right to temporarily change the rates of specific income taxes on short notice without having to ask for a prior approval by the parliament. (3) The law established that the Federal government during periods of recession may in addition to the usual annual budget set up further specific expenditure programs, designed to increase total demand, and that this additional spending may entirely be financed by issuing debt. (4) Finally, the law also called for a close harmonization of monetary policy with fiscal policy, although in its final formulation the law in no way reduced the traditional autonomy of monetary policy. Neither got the Federal government a say in the application of specific monetary policy instruments, as some politicians had proposed, nor got it access to financing government expenditure through the printing of money.

Although the stabilization law in 1967 and the immediate years to follow was considered to be an outstanding achievement, it is more than an open question what its merits were, apart from having made politicians more accustomed to reading economic forecasts and projections and, therefore, to hiring more skilled economists than they did before. The amplitude of the business cycle, in any case, has not become smaller but larger, and the rate of inflation has doubled. It is tempting to speculate on whether this has happened in spite of the policies based on that law or due to them.

The concept of monetary policy has also changed quite considerably over the years. Monetary policy in West Germany is the sole domain of the Deutsche Bundesbank. The bank is autonomous in designing its policy which by law has to aim at safeguarding the domestic value of the currency. Only insofar as it is not in conflict with this specific goal the Bundesbank has to support the Federal government's economic policy. However, one clearly cannot overlook that this autonomy of monetary policy until 1973 has always been severely limited by the superimposed adherence to fixed exchange rates. The most important change in the concept of German monetary policy has been the abandonment of the long held bank liquidity notion. According to that notion monetary policy could accomplish its goals best by influencing the cost and the availability of bank credit to the public. Cost and availability of bank credit were viewed to directly and systematically depend on the availability of free liquid reserves (bank liquidity) to commercial banks. Free liquid reserves were defined as the sum of the commercial banks' holdings of domestic and foreign money market paper, unused rediscount quotas and excess reserves held on accounts with the Bundesbank. Within the Bank's concept free liquid reserves became the key target variable and served simultaneously as the indicator of the stance of monetary policy.

After years of theoretical controversy in the German literature [4] about the analytical consistency and the empirical validity of bank liquidity notions the Bundesbank abandoned its liquidity concept early in 1973. Although the Bank never accepted academic criticism which hold that the bank liquidity notion had always given a misleading picture of the true relations, the Bank was openminded enough to realize that the validity and the credibility of the liquidity theory - which by the way was not just a speciality of the Bank but was part of the save knowledge of the vast majority of the German economic profession - fell to zero when in 1971 and 1972 Germany saw a very rapid monetary expansion although the Bank at the same time succeeded in running down the commercial banks' free liquid reserves.

Since 1973 the Bundesbank has accepted a base-money or central-bank-money concept. The new key target variable is the growth rate of the volume of central bank money. Once on its way to forget about old concepts the Bundesbank by the end of 1974 even became the avantgarde among central banks when it publicly announced its intention to stick to a fixed target growth of 8 percent p.a. for central bank money in 1975. [5]

The change in the concept of monetary policy was a basic one and to many observers may sound very monetaristic. As a matter of fact, however, the Bundesbank still is far from that. The new concept still is very tentative and contains various unsolved problems. Nevertheless, one has to acknowledge the remarkable progress the Bank has made in its policy formulation over the past three years.

IV. TESTS OF ALTERNATIVE EXPLANATIONS OF ACCELERATIONS AND DECELERATIONS OF OUTPUT AND THE PRICE LEVEL

1. Impulse Hypotheses

Any stabilization policy is based on a more or less elaborate notion or theory about how changes in policy instruments are transmitted to economic activity, how long it may take until the effects on the ultimate goals may show up and how strong the effects can be expected to be, relative to the effects of an alternative set of policy actions.

If we dismiss for good reason without further notice purely institutional explanations of movements in economic activity and inflation and concentrate on those explanations which are not in contradiction to price theory we can any theoretical notion which we come across in discussions with policymakers trace back to a fiscal explanation, a monetary explanation, a foreign impulse explanation or a Keynes-Wicksell explanation of the movements of

economic activity and of the rate of inflation. The unifying characteristic of all these explanations is the contention that changes of the rate of change of output and of the rate of inflation are the result of the interaction of demand and supply in the market place where both are shaped by the dominant and systematic working of specific impulse forces.

The fiscal explanation identifies fiscal impulses resulting from changes in government expenditure and changes in tax policies as the dominant driving force of short and medium run fluctuations in the rates of change of output and its price level.

The foreign impulse explanation concentrates on non-monetary impulses, set in motion by changes in the foreign sector's demand for domestic output as well as by changes in the import price level, as far as these are not neutralized by adverse movements of the exchange rate.

The Keynes-Wicksell explanation views continuous, autonomous changes in the entrepreneur's anticipations of the real net return on real capital as the dominant driving force.

The monetary explanation, finally, attributes short to medium run accelerations or decelerations of output and of the output price level to concurrent or previous accelerations or decelerations of the money supply, independent of what the sources of changes in the money supply are. [6)]

In what follows we will concentrate on testing the fiscal, the foreign and the monetary impulse hypothesis. It may be useful to emphasize that none of these empirical hypothesis is a monocausal one. While each of them allows all three kinds of impulse forces to have an impact on the movement of output and its price level, it enumerates a specific impulse force which is believed to have a larger effect than the remaining forces at work. This differentiates the impulse hypotheses from an eclectic point of view which can "explain" any observation and, therefore, nothing.

With respect to the comparatively closed economy of the U.S. Keynesians and monetarists have battled over the question whether fiscal or monetary impulses are the dominant driving force. [7)] This remains an important issue for open economies, as stabilization policy has to rely on fiscal and monetary tools. However, the issue then becomes a different quality in that the role of foreign impulses has to be taken into account which may very well dom-

inate domestic forces altogether, depending on the degree of the economy's world market integration.

Before moving on to the tests it might be useful to point out that testing these impulse hypotheses does not require the selection of a specific analytical framework which specifies the transmission mechanism in detail, although we prefer a monetarist view of the transmission mechanism, as it has been worked out by Brunner-Meltzer [8], to a Keynesian or a neo-Keynesian view. As we see it, the transmission of any of the impulse forces starts out from a disturbance of the initial structure of relative prices of financial as well as non-financial assets, where the given distribution of relative costs of information and adjustment in the various markets shapes the channels and the quickness of the transmission. This view implies that neither the speed of transmission nor the order of magnitude of the effects on the time pathes of the rate of inflation and of real growth should be uniform for the competing impulse forces.

2. Measurement Procedures

We wish to test which of the three impulse hypotheses explains best accelerations and decelerations of private domestic output and the price level.

Private domestic output y is defined as follows:

$y = GNP/p - wl^g/p + m^r + m^{sf}$,

where p = GNP/deflator, wl^g = expenditure for civil service, m^r = import of raw materials, m^{sf} = import of semi-finished goods.

Measurement of inflation is based on two alternative price indices. One is a cost-of-living index, p^c, the other one is a weighted index of prices which the private and the government sector have to pay for the purchase of domestic product.

The cost-of-living index has not been taken by face value. Instead we have eliminated all those prices which do only in the long run respond to market forces, while in the short and medium run being more or less determined by political considerations on the local, state or Federal government level. Therefore we have excluded prices of postal and railway services, prices of local public transport services, rents of flats and houses built before World War II or thereafter with the aid of government subsidies, prices of gas, electricity, water, and finally, food prices.

The fiscal impulse measure used here is an initial stimulus measure [9] which combines the initial effects of all discretionary fiscal policy actions. Such discretionary actions are the setting of government expenditure and of tax rates, tax bases and terms of tax payments. Our fiscal impulse measure is defined as:

$$F_t = G_t - \sum_{\tau=0}^{\tau=t} \Delta T_\tau \quad \text{Discr.}$$

The expenditure component is equal to the sum of nominal cash expenditure of Bund and Lander, net of transfer payments passed from the Bund to the Lander and net of cash expenditure directed to recipients outside the country.

The tax component is based on different estimation procedures for the fifties and for the period thereafter, depending on the availability of surveys about changes in tax legislation. [10]

Foreign impulses transmitted to the domestic economy result from the working of fiscal and monetary forces in the rest of the world. There are two main channels of transmission. One is the balance of payments. Foreign forces working through the balance of payments disturb the equilibrium of domestic asset markets and generate monetary impulses. Of these effects our measure of the total monetary impulse will take care.

The second channel is the direct influence of foreign forces on the domestic output market via the demand for domestic product and the supply of foreign product. To capture these effects we use two complementary impulse measures: One is the rate of change of an index of German import prices, $\hat{p}^I$, denominated in German currency. The second measure is the rate of change of real exports, $\hat{x}$.

A brief comment on the role of import prices may be appropriate. An acceleration of import prices induces in the short run a substitution of domestic demand for foreign product by domestic demand for domestic product, thus shifting the demand schedule for domestic output upwards. At the same time the supply schedule will alike shift upwards, as domestic suppliers will be induced to raising supply prices in response to increasing import prices. Therefore, market forces will push up the domestic rate of inflation. The effect on domestic output, on the other hand, will depend on the relative order of magnitude of the shift elasticities. About one half of German imports consists of finished goods. Therefore, it appears to be very unlikely that the induced supply response exceeds the response of demand. It follows that the net effect of changes in the growth rate of the import price level on the time

path of domestic output can be expected to be positive but small. We conclude that with regard to West Germany the net effect of changes in the import price level on domestic output can be neglected.

Our monetary impulse measure combines the monetary impulses created by foreign forces, domestic fiscal policy, domestic monetary policy, and by autonomous changes in the behavior patterns of domestic commercial banks and the public. We approximate the monetary impulse measure by the rate of change of the narrowly defined money supply, M. The selection of this definition is justified on the grounds that, in general, its rate of change exhibits a narrower association to the rates of change of output and of the price level than the rates of change of broader definitions.

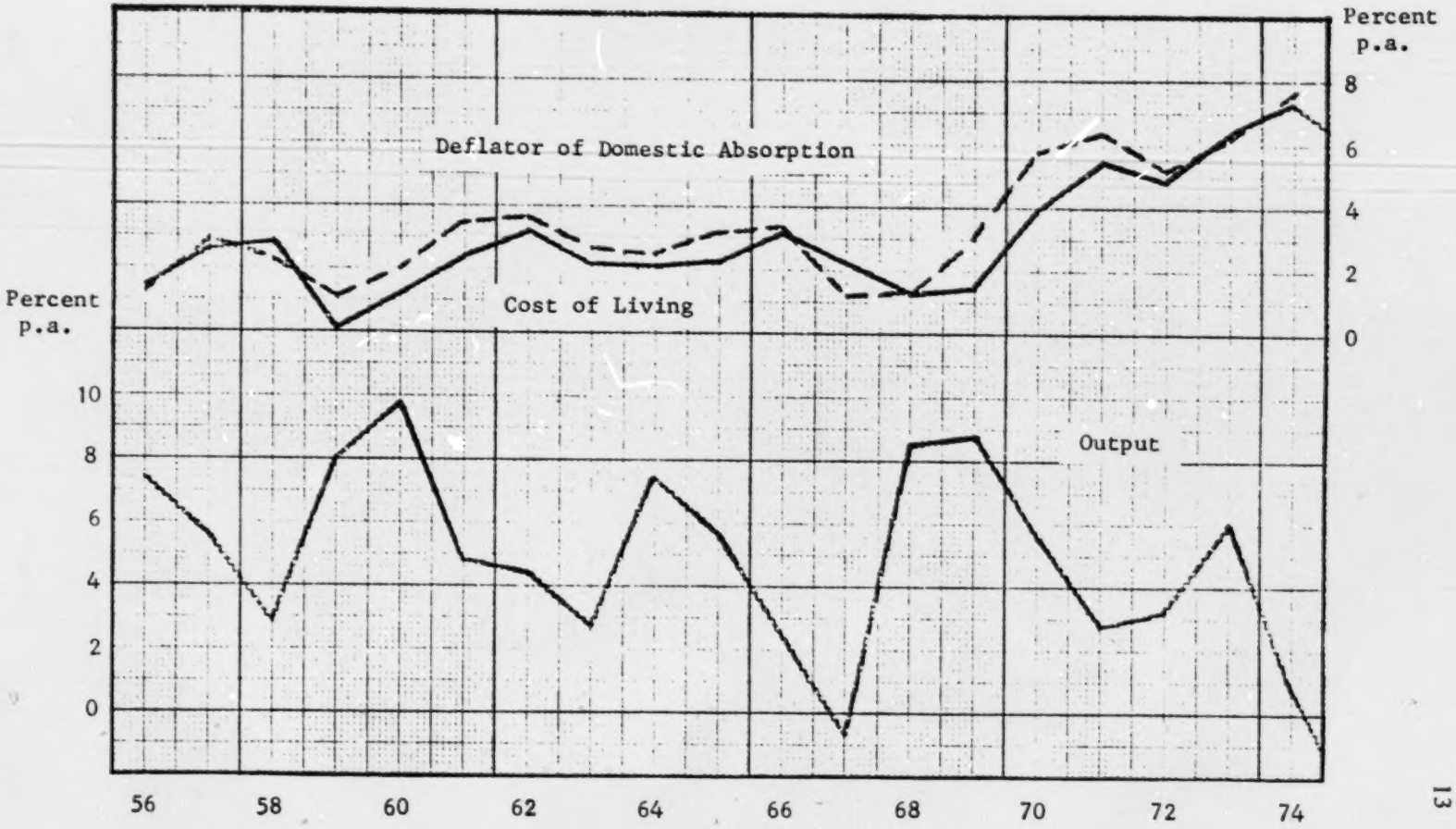
We acknowledge that by construction our monetary impulse measure is an endogenous variable. However, this must not impair our interpretation of the effects of changes in the monetary impulse. Gebauer [11] investigated the question of reverse causation and found no evidence supporting the hypothesis of a dominant reverse causation from prices to M1 while with regard to the potential existence of dominant reverse causation from output to M1 the evidence was inconclusive.

However, to allow for an alternative we will also make use of a weighted world-money-stock measure which is assumed to approximate the sum of real and monetary influences of foreign forces. The world-money-stock series used is defined as the sum of the narrowly defined money stocks of 21countries, converted into dollars at current exchange rates. [12] The use of this measure will then require to substitute the rate of change of base money, stemming from domestic sources, for the rate of change of M1.

The following two graphs describe the movements of output, prices and the impulse variables over the past two decades, based on annual average data.

GRAPH 1

Annual Rates of Change of Prices and Output



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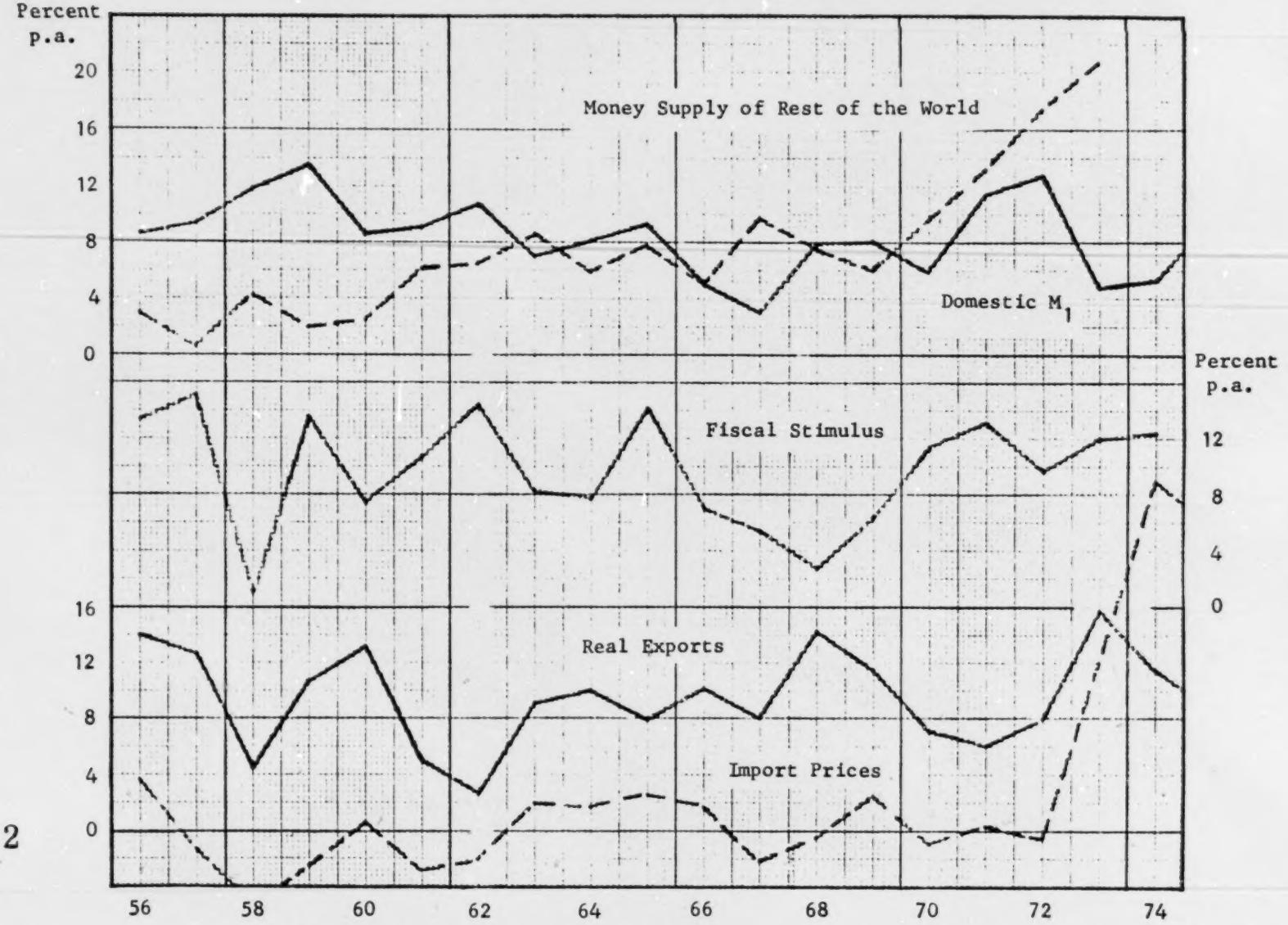
GRAPH 2

Annual Rates of Change of Impulse Measures



3. Non-parametric Tests [13)]

All three impulse hypotheses assert that accelerations (decelerations) of output and the price level are positively related to changes in impulse variables:

$$\Delta\hat{y} = f(\Delta\hat{M}, \Delta\hat{F}, \Delta\hat{x}), \text{ with } f_{1,2,3} > 0$$

$$\Delta\hat{P}^{c} = h(\Delta\hat{M}, \Delta\hat{F}, \Delta\hat{x}, \Delta\hat{P}^{I}), \text{ with } h_{1,2,3,4} > 0$$

where $\hat{M}$ = monetary impulse, $\hat{F}$ = fiscal stimulus, $\hat{x}$ = percentage rate of change of real exports, $\hat{P}^{I}$ = percentage rate of change of import price index. We concentrate on second time derivatives rather than first time derivatives for two reasons: (i) none of the impulse hypotheses asserts that changes in capacity output depend on the impulses, (ii) the almost lacking constraint from the side of the labor force during the fifties makes it inadvisable to estimate the average relationship between the impulses and the rate of inflation over the total period.

The non-parametric tests presented below are based on quarterly changes in normalized percentage rates of change, measured against the corresponding quarters of the previous year and smoothed by a 3-quarter moving average. By locating turning points we can determine subperiods of acceleration and deceleration for y and p. Neglecting minor movements of less than four quarters' length gives five accelerations and four decelerations for y and p over the period 1954 to 1973. Similarly, periods of acceleration and deceleration can be differentiated for the impulse variables.

Putting the data to test requires to form an assumption about the true timing relationship. The problem with setting such assumptions is that they determine the results of our tests. Put it differently, there are always assumptions which will lead to a falsification of any of our impulse hypotheses.

Three main properties of the timing relationships may be mentioned: (1) True lags in general differ from measured lags. On the average we can expect the gap between true and measured lags to be smallest for that impulse force which in fact is the dominant driving force of movements in economic activity and inflation. (2) For any impulse force the measured lag is not constant but changes over time, depending on the relative strength of shocks released by competing impulse forces. Therefore, the lag variation should be smallest for the strongest impulse force. (3) The average lag over time may be different for different impulse forces. The impulse variables used here lead us to expect that the average lag of the impact of monetary impulses is longer than the average lag of the impacts of the fiscal stimulus and of real foreign demand.

Taking the three properties of the timing problem into account we have decided against the usual concept of contant lags and allow for variation. In a first step we have singled out, separately for each of the impulse variables, the most favorable individual lags such that we receive a consistent sequence of accelerations and decelerations which confirms the underlying impulse hypothesis. In three further steps we have introduced restrictions on the length and the variation of the lags, in order to open the chance of falsification.

Table 4 gives information on the average lags, their standard deviations, and the spans between the shortest and the longest lags with respect to $\Delta \hat{y}$ and $\Delta \hat{P}^c$.

The restrictions are defined as follows:

Restriction I reduces the lag spans of the individual lags of

$\Delta \hat{y}$ behind $\Delta \hat{M}$ from 5 to 4,

$\Delta \hat{y}$ behind $\Delta \hat{F}$ from 7 to 5,

$\Delta \hat{y}$ behind $\Delta \hat{x}$ from 7 to 5,

$\Delta \hat{P}^c$ behind $\Delta \hat{P}^I$ from 11/12 to 7.

Restriction II requires the standard deviations of the weighted average lags of $\Delta \hat{y}$ behind $\Delta \hat{M}$, $\Delta \hat{F}$ and $\Delta \hat{x}$ to be equal.

Restriction III requires the standard deviations of the weighted average lags of $\Delta \hat{P}^c$ behind $\Delta \hat{M}$, $\Delta \hat{F}$, $\Delta \hat{x}$ and $\Delta \hat{P}^I$ to be equal.

As a consequence of the imposition of these restrictions the individual subperiods related for each impulse variable to the subperiods of acceleration and deceleration in y, P^c and P^o do not exhibit perfectly correlated movements of the impulse variables. In order to further increase the falsificability of the impulse hypotheses the individual periods of acceleration or deceleration have been subdivided into two periods of about equal length, for all cases in which the total acceleration or deceleration lasted for seven quarters or more.

The following non-parametric tests test for positive association between accelerations of output or prices and each of the impulse variables, given the ceteris-paribus assumption. The tests are based on the recently developed test statistic ∇p. [14)]

Table 4: Lags of Accelerations and Decelerations of y and P^C behind Changes in Impulses

Quarterly data 1953, IV - 1974, I

	Lag of $\Delta\hat{y}$ behind			Lag of $\Delta\hat{P}^C$ behind			
	$\Delta\hat{M}$	$\Delta\hat{F}$	$\Delta\hat{x}$	$\Delta\hat{M}$	$\Delta\hat{F}$	$\Delta\hat{x}$	$\Delta\hat{P}^I$
1. Most favorable lag assumptions							
Weighted average lag	-1.12	+1.40	-1.10	-7.20	-5.36	-7.73	-5.93
Standard deviation	1.61	2.38	2.08	2.36	2.83	2.27	2.79
Lag span	5	7	7	6/7	11	8	11/12
2. Restriction RI							
Weighted average lag	-1.53	+ .92	- .53	-7.70	-5.69	-7.12	-5.75
Standard deviation	1.30	1.68	1.51	2.06	2.41	1.81	1.81
Lag span	4	5	5	5/6	9/10	7	7
3. Restriction RII							
Weighted average lag	-1.53	+ .49	- .26	-7.70	-6.04	-6.81	-5.75
Standard deviation	1.30	1.31	1.30	2.06	2.35	1.67	1.81
Lag span	4	4/5	4/5	5/6	8	7	7
4. Restriction RIII							
Weighted average lag	-1.26	+1.03	- .53	-7.43	-5.51	-7.12	-5.75
Standard deviation	1.18	1.50	1.51	1.77	1.84	1.81	1.81
Lag span	3	4/5	5	5	7/8	7	7

To understand the test statistic consider the following contingency matrix which classifies a sample of related observations of two independently measured variables x and y,

		Y		
		+	0	-
X	+			
	0			
	-			

differentiating observations of positive values, negative values and zero values. The hypothesis of positive association between X and Y is the main diagonal hypothesis. All observations confirming the hypothesis will lie in cells on the main diagonal, falsifying observations will fall into off-diagonal cells (error cells). If all observations lie on the main diagonal, the meausre ∇p will take the value 1, if none of them appears on the diagonal, ∇p will be zero. For any actual sample of observations an empirical value of ∇p can be computed and be tested against the null-hypothesis of no positive association. The standardized ∇_p ($= \nabla p / \sqrt{\text{Var } \nabla p}$) which follows the z-statistic serves for testing the significance of the empirical ∇p on the basis of a chosen confidence level.

We use the ∇p measure with two modifications. (1) We differentiate between observations of value zero ($|x_i| < .5$), observations of large positive value, observations of large negative value, observations of small positive value and observations of small negative value. The dividing line between observations of large and small value is defined by $\sum |x_j| / N_j$ where x_j are the values of non-zero-value observations and N_j is the number of such observations.

(2) As the ∇p model permits differential weighting of the error events in assessing the prediction success, we alternatively apply two different error sets. Error set 1 implicitely regards errors as the more severe the "further" they lie above or below the main diagonal, using the squared distance as the error weight. Error set 2 is more rigid, attaching to every error the same weight.

Error Set 1

0	.0625	.2500	.5625	1
.0625	0	.0625	.2500	.5625
.2500	.0625	0	.0625	.2500
.5625	.2500	.0625	0	.0625
1	.5625	.2500	.0625	0

Error Set 2

0	1	1	1	1
1	0	1	1	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

Tables 5 to 6 present the tests for positive association between $\Delta\hat{y}$, $\Delta\hat{P}^c$, and changes in the impulse variables, given different restrictions on the lag patterns. If the standardized $\nabla p \leq 2.33$, the null-hypothesis cannot be rejected on the basis of the 1% level. These cases are marked by one star. Two stars indicate that the null-hypothesis cannot be rejected on the basis of the 5% level (stand. $\nabla p \leq 1.65$).

The most informative test results are those given the lag restrictions RII and RIII which require the standard deviations of the weighted average lags to be equal for any of the impulse variables. The central idea behind these restrictions is to put all impulse variables on an equal footing. If the reasoning is correct that the variation of measured lags will be largest for the weakest impulse variable, this procedure should yield an empirical ∇p-value for this variable that does not permit to reject the null-hypothesis of no positive association.

Consider Table 5. While the null-hypothesis of no systematic positive association between accelerations of output and changes in monetary and foreign impulses can be rejected firmly, the evidence with regard to fiscal impulses is negative. On the basis of Error Set 2 the null-hypothesis cannot be rejected at the 1%-level of significance under restriction

Table 5: Test for Positive Association between $\Delta\hat{y}$ and Changes in Impulses

78 observations

	Error Set 1		Error Set 2	
	Empirical ∇p (Standardized ∇p)			
1. Most favorable lag assumptions				
$\Delta\hat{M}$	.90	(57.93)	.46	(6.61)
$\Delta\hat{F}$	.56	(6.55)	.22	(3.09)
$\Delta\hat{x}$	.80	(26.95)	.22	(3.75)
2. Restriction RI				
$\Delta\hat{M}$	.88	(32.01)	.51	(7.44)
$\Delta\hat{F}$	.59	(7.62)	.19	(2.79)
$\Delta\hat{x}$	.81	(26.62)	.27	(4.09)
3. Restriction RII				
$\Delta\hat{M}$	.88	(32.01)	.51	(7.44)
$\Delta\hat{F}$	.49	(5.77)	.14*	(1.82)
$\Delta\hat{x}$	.85	(25.20)	.55	(8.74)
4. Restriction RIII				
$\Delta\hat{M}$	.82	(29.51)	.29	(4.43)
$\Delta\hat{F}$	.06**	(.49)	-.08**	(-2.28)
$\Delta\hat{x}$	.81	(26.62)	.27	(4.09)

Table 6: Test for Positive Association between ΔP^c and Changes in Impulses

81 observations

	Error Set 1		Error Set 2	
	Empirical ∇p (Standardized ∇p)			
1. Most favorable lag assumptions				
$\Delta\hat{M}$	.77	(23.25)	.15*	(2.24)
$\Delta\hat{F}$	.64	(6.70)	.43	(5.60)
$\Delta\hat{x}$	.77	(19.43)	.23	(3.20)
$\Delta\hat{P}^I$	.91	(52.06)	.59	(8.34)
2. Restriction RI				
$\Delta\hat{M}$	.77	(20.30)	.27	(4.01)
$\Delta\hat{F}$	.62	(6.33)	.42	(5.49)
$\Delta\hat{x}$	.77	(19.23)	.18	(2.53)
$\Delta\hat{P}^I$	.92	(49.69)	.63	(9.25)
3. Restriction RII				
$\Delta\hat{M}$	.77	(20.30)	.27	(4.01)
$\Delta\hat{F}$	.51	(4.93)	.21	(2.52)
$\Delta\hat{x}$	.77	(18.41)	.28	(3.89)
$\Delta\hat{P}^I$	.92	(49.69)	.63	(9.25)
4. Restriction RIII				
$\Delta\hat{M}$	.75	(17.92)	.26	(3.84)
$\Delta\hat{F}$	.45	(4.49)	.15	(2.55)
$\Delta\hat{x}$	.77	(19.23)	.18	(2.53)
$\Delta\hat{P}^I$	.92	(49.69)	.63	(9.25)

RII. Given restriction RIII it even cannot be rejected at the 5%-level of significance for both error sets. Judged from these results alone it seems to be unlikely that the fiscal stimulus contributed very strongly to the variation of output growth over the last two decades.

Table 6 gives the test results with respect to changes in inflation, based on the adjusted cost-of-living index P^c.

The results indicate that the null-hypothesis of no systematic positive association can unambiguously be rejected for all impulse variables. Still, it is noteworthy that ∇p is smallest for the fiscal impulse, given restrictions RII and RIII.

The non-parametric test which were based on varying measured time lags lead us to the following conclusions: (1) There is clear-cut evidence that accelerations of domestic output are positively related to accelerations of the domestic money stock and the volume of real exports. (2) There is sufficient evidence to reject the hypothesis that an expansionary course of the fiscal stimulus induces an acceleration of domestic output. (3) For none of the impulse variables the hypothesis has to be accepted that it is not positively related to changes in the rate of inflation. (4) The average measured lag of Δy behind ΔM is one to two quarters, varying between 0 and 4 quarters. The average measured lag of ΔP^c behind ΔM is seven to eight quarters, varying between 6 and 11 quarters. (5) The average measured lag of Δy behind Δx is zero to one quarter, varying between a lead of 2 quarters and a lag of 3 quarters. (6) The average measured lag of ΔP^c behind ΔP^I is almost six quarters, varying between 2 and 9 quarters. (7) The average measured lag of ΔP^c behind ΔF is almost six quarters, varying between 0 and 8 quarters.

4. Parametric Tests

The Parametric tests are based on OLS-estimates of the reduced forms

$\Delta\hat{y} = f(\Delta\hat{M}, \Delta\hat{F}, \Delta\hat{x})$, with $f_{1,2,3} > 0$

$\Delta\hat{P} = h(\Delta\hat{M}, \Delta\hat{F}, \Delta\hat{P^I})$, with $h_{1,2,3} > 0$

Each of the competing impulse hypotheses leads us to expect a specific parameter to be numerically larger than the remaining parameters.

Instead of quarterly we have used annual data, covering for the dependent variable the period 1956-1974. The obvious reason is to hold the laborous search for the appropriate lag patterns as small as possible. The choice of 1956 as the first observation was dictated by the availability of the world money stock series.

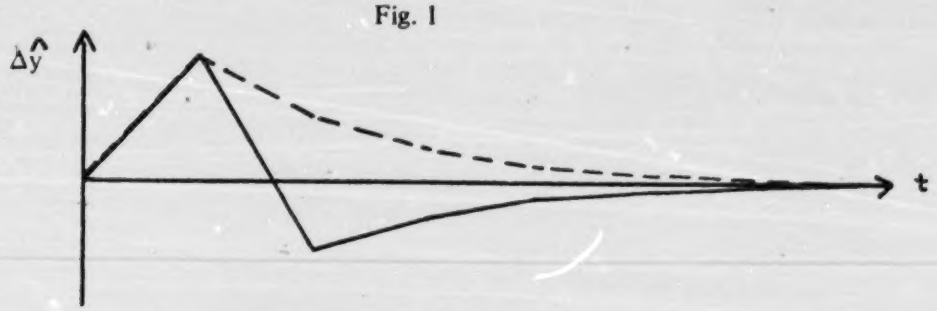
Table 7 presents regressions explaining the acceleration of output, $\Delta\hat{y}$. Equation (1) is based on the same average lags as the non-parametric tests. We have tried various lags for $\Delta\hat{M}$, $\Delta\hat{F}$, $\Delta\hat{x}$ and $\Delta\hat{P}^I$ as well but that uniformly reduced the over-all explanation considerably.

Equation (1) leads us to reject the fiscal impulse hypothesis. An acceleration of the fiscal impulse apparently has no significant net effect on the acceleration of domestic output while accelerations of the money stock and of real demand for German exports have. The parameter estimate for real exports is larger than the estimate for the money stock but by less than one times the standard error of the latter parameter. Therefore, we cannot discriminate between the monetary and the foreign impulse hypothesis.

Equation (2) takes into account that the response of $\Delta\hat{y}$ to changes in impulse variables may be conditioned by the inherited growth path of output. The negative sign of the parameter for $\hat{y}_{-1}$ is expected because an acceleration of output initiated by an expansion of the impulse forces will be eliminated by a rising growth rate of output.

Although the parameter estimates of equation (2) are less satisfactory, it is interesting to consider the time path of $\Delta\hat{y}$ that such a regression implies. Fig. 1 shows that an once-and-for-all increase of the growth rate of the money stock or of real exports (solid line) induces first an acceleration and thereafter a deceleration of output which will gradually be eliminated over time. If regression (2) were reliable, it would take about eight years until output would be back on its equilibrium path.

Fig. 1



The dashed curve describes the time path of Δy, given a permanent constant acceleration of the money stock and/or real exports.

Table 7: Regressions Explaining the Acceleration of Output

Annual Data

Period	Const.	$\Delta\hat{M}$	$\Delta\hat{F}$	$\Delta\hat{x}$	$\hat{y}_{-1}$	$\Delta\hat{M}^{W}_{-1}$	$\Delta\hat{DB}$	$\Delta\hat{r}$	$\bar{R}^2$	StE^2	DW
1956-1974											
(1)	-.36	.48	.00	.65					.51	7.15	1.91
	(-.59)	(2.40)	(.03)	(4.52)							
(2)	2.24	.27	.07	.43	-.47				.57	6.24	1.87
	(1.43)	(1.22)	(.61)	(2.36)	(-1.79)						
1957-1974											
(1)	-.14	.44	.01	.64					.55	6.28	2.19
	(-.23)	(2.28)	(.42)	(4.78)							
(2)	1.35	.33	.04	.51	-.28				.54	6.46	2.01
	(.67)	(1.36)	(.42)	(2.35)	(-.77)						
1956-1973											
(1)	-.29	.48	.01	.63					.49	7.53	1.83
	(-.45)	(2.32)	(.05)	(4.20)							
(2)	2.53	.25	.07	.39	-.50				.57	6.39	1.88
	(1.56)	(1.11)	(.67)	(2.05)	(-1.87)						
(3)	-1.12		.06			.71	.01	.07	.35	9.59	1.89
	(-1.42)		(.44)			(2.43)	(1.06)	(1.68)			
(4)	5.08		.18		-.93	-.19	.00	.06	.61	5.66	2.10
	(2.47)		(1.71)		(-3.16)	(-.51)	(.46)	(1.99)			

t-ratios in brackets

Regressions (3) and (4) experiment with the world money stock outside West Germany. This variable is supposed to approximate the total impact of foreign real and monetary impulses. The domestic part of money creation may then be approximated by the net domestic component of the monetary base, DB, and by a representative minimum reserve ratio, r. The experimenting with $\Delta\hat{M}^W$ so far has not proven to be successful. Although regression (3) shows an expected positive and relatively large parameter for $\Delta\hat{M}^W$, the overall explanation of output accelerations is much smaller than those given by regressions (1) and (2). We also note that the sign of the parameter of $\Delta\hat{r}$ should be negative instead of positive. Regression (4), finally, does not make any sense. We suspect that the time series of the world money stock outside West Germany is not very reliable. [15] If it were reliable one would have expected that it at least contributes to explaining the path of German inflation. But regression (3) of table 8 shows that it performs very badly.

Apart from the world money stock we find that changes in monetary and fiscal impulses as well as the acceleration of the import price level jointly explain accelerations of the German price level P^c to a relative high degree. If we cut off 1956, the adjusted coefficient of determination jumps from .53 to .74 in the case of regression (1). This suggests that it may be worthwhile to eliminate the fifties completely from the sample period in future work.

The timing relationships assumed in regression (1) are those suggested by the non-parametric tests. We have tried longer as well as shorter time lags but this led to less satisfactory explanations. The additional inclusion of lagged changes of the growth rate of real exports also did not improve the estimates because accelerations of real exports and of the import price level are highly positively correlated.

Regression (1) shows that the impact of the monetary impulse is significantly larger than the impact of the fiscal impulse. The estimated parameter for $\Delta\hat{M}_{-2}$ exceeds the estimated parameter for $\Delta\hat{F}_{-1}$ by one times the standard error. However, the monetary impulse does not dominate the impact of import prices. Finally, we note that the inclusion of current changes in the real rate of growth did not add to the explanation.

Table 8: Regressions Explaining the Acceleration of the Price Level P^c

Period	Const.	$\Delta\hat{M}_{-2}$	$\Delta\hat{F}_{-1}$	$\Delta\hat{P}^I_{-1}$	$\Delta\hat{P}^I_{-2}$	$\Delta\hat{y}$	$\Delta\hat{M}^W_{-2}$	$\Delta\hat{DB}_{-2}$	$\Delta\hat{r}_{-2}$	$\bar{R}^2$	StE	DW
1956-1974												
(1)	.17	.18	.09	.05	.15					.53	.70	1.70
	(.89)	(2.29)	(2.71)	(.84)	(2.48)							
(2)	.18	.18	.09	.05	.16	.01				.49	.75	1.67
	(.86)	(2.21)	(2.57)	(.83)	(2.11)	(.20)						
(3)	.19		.08			-.09	.01	.00	.02	.35	.97	2.27
	(.74)		(1.96)			(-1.31)	(.10)	(.77)	(1.21)			
1957-1974												
(1)	.27	.17	.11	.06	.25					.74	.40	1.56
	(1.76)	(2.80)	(4.09)	(1.34)	(4.57)							
(2)	.27	.17	.11	.06	.26	.02				.73	.43	1.51
	(1.72)	(2.75)	(3.93)	(1.37)	(4.05)	(.45)						
(3)	.26	.09				-.11	.01	.00	.02	.40	.94	2.26
	(.98)	(2.17)				(-1.54)	(.01)	(.81)	(1.12)			
1956-1973												
(1)	.19	.17	.09	.07	.15					.52	.74	1.64
	(.91)	(1.97)	(2.57)	(.83)	(2.41)							
(2)	.19	.17	.09	.07	.16	.01				.48	.80	1.61
	(.88)	(1.91)	(2.43)	(.82)	(2.04)	(.18)						
(3)	.18		.08			-.11	.04	.00	.02	.34	1.03	1.98
	(.66)		(1.79)			(1.36)	(.34)	(.72)	(1.27)			

t-ratios in brackets

V. THE CONTROLLABILITY OF THE MONEY SUPPLY

To base stabilization policy on the use of monetarytools requires that monetary authorities are in a position to control monetary expansion with sufficient a degree of precision in the shorter run, where the shorter run is considered to be defined in quarters rather than months, weeks or even days. In the long run monetary policy in an open economy, given a fixed exchange rate regime, clearly is impotent as we know from the monetary approach to balance-of-payments theory.[16] In the shorter run, however, this must not be the case. Full adjustment of all domestic and foreign asset and output markets involved does not take place instantaneously, due to the operation of information and adjustment costs which especially delay the adjustment of output markets. Nevertheless it has repeatedly been asserted by European government officials as well as by academic economists that "offsetting capital flows" render monetary policy ineffective even in the shorter run.

We contend that the notion of offsetting capital flows is not very well founded [17] and is not backed by the evidence available from West Germany. If the notion were true, how would one explain the fact that West Germany during the sixties effectively managed to lay behind the international development of inflation? But let us have a closer look into the evidence.

Table 9 gives the average contribution of international reserve flows to the monetary expansion over the period 1959 to 1972. If one differentiates subperiods of monetary acceleration from subperiods of monetary deceleration one clearly finds a strong procyclical movement in the contribution of international reserve flows to monetary expansion. This observation is consistent with the notion of offsetting capital flows but it does not constitute conclusive evidence. For the notion to hold one would have to observe a larger rate of monetary expansion during periods of international reserve inflows than during periods of reserve outflows. Table 12 shows that this was not the case. The average rate of growth of M1 was larger during periods of reserve outflows than during periods of reserve inflows. Thus total domestic forces, operating on the money supply, overcompensated foreign forces in the shorter run.[18]

Table 9 : Proximate Determinants of the Money Supply

Percent p.a.

Periods of:	Monetary Expansion $\hat{M1}$	Contribution of Total Base Money Creation $\hat{B}^e$	Net International Reserve Flows $E(M1, NIR)\,\hat{NIR}$
Monetary Acceleration	9.6	8.9	12.3
Monetary Deceleration	7.1	7.5	- 2.2
Rising Intern. Reserves	8.3	8.5	15.0
Falling Intern. Reserves	9.2	8.1	- 7.7
Total Period	8.6	8.4	6.9

Next consider the following estimate of an capital-flow equation for Germany which has been presented by Kouri and Porter[19] for the period 1960, I to 1970, IV:

$$TC = 238.5 + 0.11\Delta Y + 115.4\,\Delta R^* - 0.77\Delta DC - 0.95\,CAB$$
$$(1.30) \quad (4.1) \quad (0.45) \quad (18.40) \quad (10.58)$$

$$+ 1{,}798\Delta D1 + 2{,}027\Delta D2 + 2{,}703\,\Delta D3 + 1{,}783\,\Delta S_4 \qquad R2 = .96$$
$$(2.91) \quad (3.11) \quad (2.92) \quad (7.16) \qquad DW = 2.17$$

TC = Total private capital flows, Y = income, R* = 3-month Euro-dollar rate, DC = domestic component of extended monetary base, CAB = current account balance including official capital flows, $D_{1,2,3}$ = speculation dummies, S_4 = seasonal dummy.

The hypothesis behind this equation is clearly the offsetting capital flow notion.[20] Whenever domestic monetary policy (represented by DC) or the current account balance changes, offsetting capital flows will be induced. Kouri and Porter found an offsett coefficient of -0.77, significantly different from minus unity. They themselves concluded: "This means that the Bundesbank can exercise some degree of monetary independence in the short run if it is willing to accept the reserve movements which that policy entails."

In a more recent paper[21] Kouri came up with a lower offsett coefficient of -0.70 from an estimate over the period 1960, I to 1972, II;

$$TC = 260.1 + 0.47\,\Delta Y - 505.9\Delta R^* - 340.3\,\Delta FP - 0.70\,\Delta DC$$
$$(1.43) \quad (4.50) \quad (2.36) \quad (4.95) \quad (17.34)$$

$-0.94\ CAB + Dummies + \Delta S_y$ $\quad R2 = .96$

(10.63) $\quad DW = 2.23$

where FP = forward premium.

However, the numerical value of the offset coefficient might be even lower than 0.70 for the following reason: Kouri and Porter included besides ΔDC the current account balance CAB as a determinant of TC, and rightly so because the current account is just another autonomous source of base money creation. Therefore, it should affect capital flows in the same way as changes in monetary tools do. Kouri and Porter emphasized this but, surprisingly they never presented an estimate of the capital flow equation which combines both sources in one variable. If ΔDC and CAB are positively correlated, as the estimates suggest, then the joint offset coefficient might be numerically smaller than 0.70. A preliminary simple regression of TC on the sum of ΔDC and CAB over the period 1960, I - 1972, II (omitting the quarters which Kouri explained by speculation dummies) led to a joint offset coefficient of -0.54. This result is suggestive although certainly not conclusive. A more thorough reinvestigation into this issue is under the way.

So far it seems safe to conclude that the notion of offsetting capital flows does not stand up well against the evidence. While interest rate differentials induce capital flows, these were not large enough to render West Germany's monetary policy obsolete. Certainly, this does not mean to deny that under fixed exchange rates the market pressure for domestic adjustment may become overwhelming when the discrepancy between domestic and foreign rates of inflation becomes large enough to raise spreading speculation on a correction of official exchange rates. The German experience of the early seventies offers indeed dramatic evidence in this respect. But this is a completely different issue that is not covered by the notion of offsetting capital flows.

Apart from international reserve flows a second factor has to be considered that may have contributed to reduce the potency of German monetary policy in the past, and this is the commercial banks' borrowing from the central bank. As a matter of fact, German banks had an unlimited and automatic access to central bank credit through the discount and the lombard window. Officially, borrowing was confined to the limits of rediscount quotas that policy makers always considered an effective monetary tool and, therefore, changed quite frequently. In fact, however, all commercial banks taken together never used up more than 50 percent of the quotas all over the sixties. This observation led many observers to believe that the Bundesbank had never full control over the money supply during the years prior to 1973 when the rediscount quotas became a really biting constraint .

We are not in a position to answer the question whether the Bundesbank actually controlled the money supply in the past. This would require to know precisely what the intended behavior of the Bank was. What we can do instead is to measure the average compensation of changes in "uncontrolled" sources of the base by opposite changes in policy controlled sources. The resulting coefficient of compensation can be interpreted to indicate the minimum degree of controllability which the Bundesbank exercised in the past.

To simplify matters suppose the Bundesbank had no direct control over the source components net international reserves, NIR, and net borrowing of commercial banks, NRF. Given the source-definition of the extended monetary base

$$\Delta BE = \Delta NIR + \Delta NRF + \Delta NDC$$

we may regress changes in the directly controlled source component NDC on the sum of concurrent changes in the sources NIR and NRF. Table 13 gives the resulting coefficients of compensation, estimated from quarterly data over the period 1959-1972.

Table 10: Average Compensation of Endogenous Base Money Sources

	Coefficient of Compensation	t-value	R^2
Total Period, 1959-1972	-.77	-23.37	.91
Periods of Monetary Acceleration	-.75	-24.13	.89
Periods of Monetary Deceleration	-.99	-22.43	.94
Periods of Rising International Reserves	-.72	-15.89	.88
Periods of Falling International Reserves	-.90	-10.91	.86

The results point to a relative high degree of controllability of base money creation in the past. Measured over the total period 1959-1972 the Bank on average compensated 77 percent of the summed changes in source components not under its direct quantity control. Most noteworthy is the observed asymmetry in the average coefficient of compensation during subperiods. The coefficient was numerically larger during periods of monetary deceleration or falling international reserves.

The asymmetry may be interpreted to confirm the contention that monetary authorities in open economies are better equipped to fight deflation rather than inflation. On the other hand it may equally well be just the reflection of a deliberate cyclical behavior of the authorities which after all is the guiding principle of traditional stabilization policy.

Finally, it may be useful to note that during the period of fixed exchange rates domestic monetary control has never been seriously hampered by adverse variations of the money multiplier. Measured on a quarterly basis the multiplier, defined as the ratio of the narrow money stock M1 and the extended monetary base B^e, has always been fairly stable. Over the period 1958-1972 its coefficient of variation was 0.02 (mean: 1.62). While it is true that the coefficient of variation of the multiplier's relative rates of change was much larger (8.46), it has to be recognized that this is not an appropriate measure of the multiplier's stability because the mean rate of change was close to zero (0.24 percent p.a.).

VI. SUMMARY AND CONCLUSIONS

The major results of the tests presented in this study may be summarized as follows: (1) The evidence from the open economy case of West Germany strongly supports the monetarist hypothesis that monetary impulses dominate fiscal impulses in shaping cyclical fluctuations of domestic output as well as of the price level. (2) While the evidence corroborates the hypothesis that fiscal impulses contribute to the emergence of inflation, it does not support the contention that fiscal impulses have any significant net effects on the growth of output in the shorter run. (3) The evidence confirms what one would expect for an open economy, namely that real foreign impulses play a significant role with respect to both, movements of the domestic price level as well as movements of output.

In the West German case the impact elasticities of real foreign impulses were about equal to the impact elasticities of monetary impulses in the past. (4) The evidence does not lend support to the contention that given fixed exchange rates monetary policy cannot control monetary impulses in the shorter run due to offsetting capital flows, induced by interest rate differentials.

The results suggest that the traditional tying of government spending and tax policies to the shorter run considerations of stabilization policy lacks justification. Over the short to medium run the effects of fiscal policy apparently are allocative rather than aggregative. To free fiscal policy from having to contribute to the aim of stabilizing cyclical fluctuations of output and the price level would permit to stabilize the time path of fiscal impulses. This would be an important contribution to a more efficient allocation of resources because it would reduce the uncertainty of economic agents about the future course of fiscal policy and about the consequences it may have for the shorter run development of economic activity and inflation.

Such a conceptual change would mean to entirely hand over stabilization policy to monetary authorities. This leads immediately to the next question of whether monetary authorities should follow Milton Friedman [22] and aim at stabilizing the time path of monetary impulses, which is clearly appropriate in the case of a relatively closed economy, or whether it is more advisable to design a courageous anticyclical policy, aiming at neutralizing the impact of fluctuations in real foreign impulses. We believe that the choice of the last solution requires much more information than we have today and, moreover, that the threat foreign impulses pose to the stability of the domestic economy will become less

serious in the future, due to the operation of flexible exchange rates. But we acknowledge that the alternative solution may still leave us with serious problems from time to time.

Footnotes

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1) The unemployment figures of the fifties largely reflect a continuous inflow of people from East Germany. Between 1950 and 1960 the total West German labor force increased by 5.0 billion people, to be compared with 2.1 billion between 1960 and 1970. Today's total labor force is 21.4 million.

2) But note that officials of the Deutsche Bundesbank never accepted that view officially.

3) See W. Eucken, Grundlagen der Nationalökonomie, 5. ed., Godesberg, 1947, and his Grundsätze der Wirtschaftspolitik, Bern-Tübigen 1952; F. Böhm, Wettbewerb und Monopolkampf. Berlin 1933; A. Müller-Armack, Wirtschaftslenkung und Marktwirtschaft, Hamburg 1947; W. Röpke, Civitas Humana, Grundfragen der Gesellschafts- und Wirtschaftsreform, Erlenbach-Zurich 1944.

4) See M.J.M. Neumann, Bank Liquidity and the Extended Monetary Base as Indicators of German Monetary Policy. in K. Brunner (ed.), Proceedings of the First Konstanzer Seminar 1970, Berlin 1972, pp. 165-217; K. Brunner and M.J.M. Neumann, Analyse monetärer Hypothesen des Sachverständigenrats zur Begutachtung der gesamtwirtschaftlichen Entwicklung, Kyklos, 24 (1971), pp. 223-39; W. Möller, G. Vogel and A. Woll, Moderne Quantitäts - versus Liquiditäts theorie: Ein Test konkurrierender Hypothesen, Kredit und Kapital, 5 (1972), pp. 156-67.

5) The Bundesbank's definition of central bank money is very special: It is the sum of currency in circulation plus domestic liabilities of commercial banks to nonbanks, the latter multiplied by minimum reserve ratios which prevailed in January 1974. See Deutsche Bundesbank, Central Bank Money Stock and Free Liquid Reserves, Monthly Reports, 26 (1974), pp. 14-23; for a theoretical assessment of the new concept see M.J.M. Neumann, Konstrukte der Zentralbankgeldmenge, Kredit und Kapital, 8 (1975), pp. 317-45.

6) See K. Brunner, The "Monetarist Revolution" in Monetary Theory, Weltwirtschaftliches Archiv, 105 (1970), pp. 1-30;

7) See for example L. C. Andersen and J. L. Jordan, Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization, Federal Reserve Bank of St. Louis Review, 50 (November 1968), 11-24; F. Deleeuw and J. Kalchbrenner, Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization: Comment, Federal Reserve Bank of St. Louis Review, 51 (April 1969), pp. 6-11; P. Schmidt and R.N. Waud, The Almon Lag Technique and the Monetary Versus Fiscal Policy Debate, Journal of the American Statistical Association, 68 (March 1973), pp. 11-19.

8) K. Brunner and A. H. Meltzer, A Monetarist Framework for Aggregative Analysis, in K. Brunner (ed.), Proceedings of the First Konstanzer Seminar, op. cit., and by the same authors, Money, Debt, and Economic Activity, Journal of Political Economy, 80 (1972) pp. 951-77.

9) See W.H. Oakland, Budgetary Measures of Fiscal Performance, Southern Economic Journal, 35 (1969); E.G. Corrigan, The Measurement and Importance of Fiscal Policy Changes, Federal Reserve Bank of New York Monthly Review, 1970, pp. 133-145.

10) Details of the estimation are discussed in my paper The Monetary Fiscal Approach to Inflation: The German Case, Universitat Konstanz, Diskussionsbeitrage des FB Wirtschaftswissenschaften, No. 96, 1971.

11) W. Gebauer , Die Kausalitatsbezie hungen zwischen Geldmenge, Preisen und Produktion, Zeitschrift f.d. gesamte Staatswissenschaft, 131 (1975), pp. 603-626.

12) The countries are: Australia, Austria, Belgium-Luxemburg, Canada, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Japan, The Netherlands, New Zeland, Norway, Portugal, Spain, Sweden, Switzerland, U.K., USA. I am grateful to A.H. Meltzer and P. Korteweg for having made available this world money stock proxy.

13) The tests reported in this and the next section are preliminary results of a current project of the International Monetary Consortium (IMC) on the inflation problem in open economies. Apart from the author the IMC consists of Karl Brunner, Dean Dutton, Andre Fourcans, Michele Fratianni, Peter Jonson, Allan H. Meltzer and Johan Myhrman. See K. Brunner, M. Fratianni, J.L. Jordan, A.H. Meltzer, M.J.M.Neumann, Fiscal and Monetary Policies in Moderate Inflation: Case Studies of Three Countries, Journal of

Money, Credit and Banking, 5 (1973), pp. 313-353; M. Fratianni, Discriminating between Alternative Hypotheses of Inflation in the Italian Experience, Paper presented at the 6. Konstanzer Seminar on Monetary Theory and Monetary Policy, June 1975; A. Fourcans and M. Fratianni, An Empirical Analysis of French Inflation, Paper presented at the 6. Konstanzer Seminar, June 1975; P. Korteweg, Inflation, Economic Activity and the Operation of Fiscal, Foreign and Monetary Impulses in The Netherlands, Netherlands School of Economics, Working Paper, No. 7518, September 1975.

14) See D.K. Hildebrand, J.D. Laing, H. L. Rosenthal, Prediction Logic: A Method for Empirical Evaluation of Formal Theory, Journal of Mathematical Sociology, 3 (1974), pp. 163-85 and by the same authors, Prediction Analysis of Cross Classifications, John Wiley and Sons, Inc. 1975.

15) The series was computed from data published in the International Financial Statistics. Casual inspection of the German and the Italian data has shown that there are large differences to national statistics from time to time.

16) See R.A. Mundell, International Economics, New York: Macmillan 1968; H.G. Johnson, Inflation and the Monetarist Controversy, Amsterdam: North-Holland, 1972.

17) See K. Brunner, Monetary Management and the Central Banks, Mimeographed paper, 1973, pp. 42-47; M. Fratianni, Domestic Bank Credit, Money, and the Open Economy, in: Proceedings of the 1974-Leuven-Conference on Bank Credit, Money, and Inflation, M. Fratianni (ed.), Kredit und Kapital, Beiheft 3 (forthcoming).

18) For a more detailed investigation see M.J.M. Neumann, A Theoretical and Empirical Analysis of the German Money Supply Process, 1958-1972, in: Issues in German Monetary Economics: The Proceedings of the 1974 University of Surrey Conference, St. F. Frowen and M.H. Miller (eds.), University of Surrey Press (forthcoming).

19) P.J.K. Kouri and M.G. Porter, International Capital Flows and Portfolio Equilibrium Journal of Political Economy, 82 (1974), pp. 443-66.

20) In passing we note that Kouri and Porter, on the basis of their Keynesian model, conclude that at least in a state of perfect capital market integration the offset coefficient would become minus unity. We content that this conclusion does not hold: (i) Fratianni

has shown that Kouri and Porter would find the coefficient numerically to be below unity, if they would treat non-human wealth as endogenous; See M. Fratianni, A Note on P.J.K. Kouri and M.G. Porter "International Capital Flows and Portfolio Equilibrium, unpublished, 1975, (ii) Within a monetarist model that explicitely incorporates an appropriate formulation of the open economy's domestic credit market it can likewise be demonstrated that the offset coefficient will always be numerically smaller than unity; see M.J.M. Neumann, Determinants of the Interest Rate in an Open Economy, forthcoming paper.

21) P.J.K. Kouri, Die Hypothese konterkarierender Kapitalstrome, Kredit und Kapital, 7 (1975), pp. 1-27.

22) M. Friedman, The Role of Monetary Policy, American Economic Review, 58 (1968), pp. 1-17.

A Study in West German Stabilization Policy, 1956-1974

comment*

by
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Manfred Neumann's review of stabilization policy in the Federal Republic of Germany is a welcome contribution to the discussion of relative policy influences and to our knowledge of the causes of the remarkable progress and stability in that country over the past two decades. He constructs three measures of economic stimuli, reviews the observed correlations between this group of variables and the course of output and prices, and derives two principal conclusions. The first conclusion follows directly from the econometric results: that monetary impulses totally dominate fiscal impulses in their correlation with output, and partially dominate them with respect to the price level. The second conclusion requires further inference: that monetary policy but not fiscal policy should in the future be used for stabilization purposes.

The major problem with the procedure used in this paper is that the statistical technique which is employed -- reduced-form analysis of aggregate demand relationships -- is not equipped to produce answers to the questions being asked. When one regresses, as Neumann does here, the acceleration of output on a set of impulse vectors (monetary, fiscal, and export volume), one then discovers the importance that these stimuli have had in the past.

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*This version of these remarks has benefitted from my discussions with Professor Neumann. Interpretations and remaining errors are, of course, my own.

One may also discover whether these stimuli are capable of influencing output, depending inter alia on whether policies have been conducted effectively in the past. To visualize this problem, refer to Figure One. The diagram incorporates standard assumptions about the shapes of the aggregate supply and demand curves, with both full-employment and under-employment (short-run) equilibria possible.

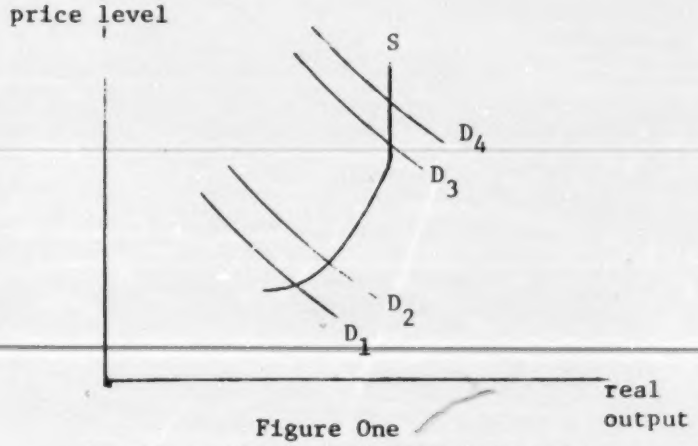

Figure One
Aggregate Supply and Demand Curves

The aggregate demand curve in general can be shifted by any of the stimuli employed by Neumann, and perhaps by others as well. But the findings reported by Neumann are somewhat curious. When he examines the impacts on real output, he finds that monetary but not fiscal stimuli are important. But when he uses the price level as the dependent variable, both forces seem to matter. Since both activities presumably operate almost entirely on the demand curve, this dichotomy seems puzzling. The solution may well be found in the timing of observed policy actions. Suppose that monetary impulses have occurred frequently at low output levels (shifts in demand from D_1 to D_2, for example), while fiscal impulses have occurred predominantly (and therefore

mistakenly at high-output levels)as shown by shifts from D_3 to D_4). One would then find precisely the kind of results reported here by Neumann.

Have fiscal policies in the Federal Republic been as poorly timed as this analysis suggests? A glance at Nemann's Graphs 1 and 2, comparing output changes with the "fiscal stimulus" measure, suggests that they have. Throughout the Erhard "economic miracle" period - up to 1967 - the fiscal variable was strongly procyclical; increases in output produced rising tax revenues which apparently provided the incentive and the means for higher public expenditure. Three of the four observed peaks in fiscal stimulus during that first decade coincided with above-average growth in real output.

In 1966 and 1967, the German economy, subjected both to external shocks and a restrictive monetary policy, suffered its first major recession of this period. As tax revenues fell, the Erhard government allowed expenditures to fall and proposed increases in tax rates. At precisely the point when fiscal stimulus was most needed (D_1 to D_2), the government worked hard to move in the opposite direction. The Erhard government then fell, a new cabinet including the "Keynesians" Karl Schiller and Franz-Josef Strauss was constituted, and the Growth and Stabilization Law was passed with the intent of providing for a more effective countercyclical policy. Nonetheless, the new government under Chancellor Kiesinger continued to emphasize the importance of restoring balance to the Bund's cash budget, and not until the final quarter of 1967 - well after the trough of the recession - did public expenditure policy shift significantly toward expansion (D_3 to D_4).

The final episode of fiscal stimulus covered by Neumann's review began toward the end of 1973. Output was beginning a sharp deceleration in response both to a contractionary monetary policy and to the severe effects

on the aggregate supply schedule from the fourfold increase in the price of imported fuel. The importance of the latter should be obvious from casual observation and can be inferred from the import price curve in Neumann's Graph 2. But import prices are omitted from Neumann's tests; consequently, the coincident drop in German monetary growth is credited as the dominant force behind the fall in output. More importantly, the omission of import prices understates the cumulative downward pressure on real income and the cumulative upward pressure on prices throughout 1974. As the role of fiscal stimulus then was to attempt to truncate the recession, this omission must also underestimate the impact of fiscal policy on output and overestimate its impact on prices.

This review of observed fiscal stimuli therefore confirms Neumann's first conclusion, viz that monetary impulses have clearly been more important than fiscal impulses as explanators of the course of activity in the German economy in the past two decades. But the reasons now appear to be different from those suggested by Neumann. The heart of the problem is that at least until 1973 there had been no effective countercyclical fiscal policy in the Federal Republic, while monetary policy was indeed quite active. It is possible to judge on the basis of that record, without benefit of econometric analysis, that these fiscal impulses could not possibly have been of any great significance.

Turning to the specifics of the econometric tests, it is tempting to quibble over a variety of choices. Neumann is estimating aggregate demand relationships; why does he not report results using aggregate demand (nominal income) as the dependent variable? He argues that the extended monetary base is the most truly exogenous policy variable; why then does he use the more troublesome money supply as his measure of the monetary impulse?

(The finding of a very high correlation between the two does not render the choice academic.) He argues that the Bundesbank has the ability to control the monetary impulse, but he does not show that it has in fact done so, an omission that opens Pandora's endogeneity box.

To clarify this last point, refer to Neumann's Table 10. The table reports a high negative correlation between domestic credit (controlled by the Bundesbank) and the sum of changes in international reserves and net borrowing by commercial banks (largely exogenous to the central bank). Neumann concludes that the Bundesbank thereby can be said to have offset movements in the latter two items by variations in domestic credit. But those two items themselves must be significantly and inversely affected either directly or indirectly by changes in domestic credit. The existence of a large negative correlation thus would seem to provide evidence that the Bundesbank has not offset these reactions. The monetary base and by extension the supply of money thereby become endogenous variables.

It nonetheless seems unlikely that a revamping of the statistics to accommodate these suggestions would seriously alter the principal results, which after all do accord both with intuition and observation. The problem is with Neumann's second conclusion, that fiscal policy is an inappropriate stabilization tool. There is nothing in Neumann's analysis to warrant such an estimation. One can conclude quite happily that so long as the government insists on procyclical variation of the budgetary balance it is unlikely to achieve countercyclical results. The effectiveness of counter-cyclical policy is the issue at stake, but there is no way that it can be tested by means of the reduced-form analysis employed here. That question

requires either a period of observed countercyclical policy or the construction of a structural model capable of producing simulations of such a policy. And that is the challenge effectively posed by Neumann in this paper.